

Lock Springs Bridge
Spanning the Grand River
on Cart Road 127
Lock Springs Special Road District
Lock Springs vicinity
Daviess County
Missouri

HAER No. MO-46

HAER
MO,
31-LOSP.V,
1-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
Rocky Mountain Regional Office
National Park Service
U. S. Department of the Interior
P. O. Box 25287
Denver, Colorado 80225

HISTORIC AMERICAN ENGINEERING RECORD

Lock Springs Bridge

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1

Location: Located on Cart Road 127 ovsr the Grand River in Lock Springs Special Road District, Harrison Township, Daviess County, Missouri. In Sections 10 and 11, Township 58 North, Range 26 West. It is approximately 1 mile west of Lock Springs or .75 mile west and 2.5 miles south of junction of State Route V and State Route 190.

UTM: Latitude: 39 degrees, 48 minutes, 07 seconds
Longitude: 93 degress, 47 minutes, 17 seconds
Quad: Breckenridge

Date of Construction: 1927

Builder/Designer: Chillicothe Iron Company, Chillicothe, Missouri

Presnt Owner: Daviess County
Daviess County Courthouse
Gallatin, Missouri 64640

Present Use: Vehicular bridge, to be replaced by a new vehicular bridge. Projected date of removal: Spring 1989.

Significance: The main span of the Lock Springs Bridge is an example of common Pratt truss used sxtsnstively through the country from 1844 to the early part of this century. The origin of the Warren truss approach spans is unknown.

Compiled by: Bill Arthaud, North District County Commissioner
Beth M. Whesler

December 1988

I. HISTORY

Because the Lock Springs Bridge was created as a result of work by the South Daviess County Drainage District, county records do not contain specific information regarding construction of this bridge.

The information on which this report is based came from family records of one of the supervisors, Floyd Tuggle, and county newspapers.

A. Formation of Drainage District

On June 15, 1915, a survey was conducted by the U. S. Drainage Investigative Department. That survey showed that between Brunswick and the Chillicothe River Bottom there was a fall of 2 feet per mile.¹

After a large flood in 1915, landowners circulated a petition to submit the formation of a drainage district to the Circuit Court, according to the requirements of Missouri laws. Nearly all of the landowners signed the petition and the matter was submitted to a vote. Each landowner had one vote for each acre in the proposed district.

The ballot proposal passed and five supervisors were elected with full authority to proceed with the formation of the district and with authority to take all legal actions necessary.

The five supervisors elected to serve were Floyd Tuggle, E. H. Greenwood, W. L. Newman, Floyd Weldon, and Estes Youtsey.

On June 15, 1916, Mr. Floyd Tuggle was appointed chairman of the South Daviess County Drainage District.² He was responsible for drawing the plans and surveying the landowners to assess their interest. Estimates of the cost of the drainage district at this time were \$10 per acre.³

Engineers from the Federal government inspected the situation and, on November 2, 1916, estimated that at least 25,000 acres would be impacted by a flood in this area. The total estimated cost was \$250,000.⁴

The South Daviess County Drainage District was incorporated in January 1920 for a period of 50 years. The reason for forming the district was for flood protection. Some of the smaller streams upstream had been straightened, which increased the frequency and extent of flooding in the river bottom land in Daviess County. The Muddy Creek Drainage District had been organized a year or two

previously, and their project demonstrated the success of a straight stream and it also greatly affected the flooding below.

After the organization of the district, the supervisors selected an attorney and then a chief engineer. Mr. Nat S. Cruzen was hired as an attorney and served until his death several years later.

After reviewing several candidates for chief engineer, the supervisors hired Chauncey Weigner of Memphis, Missouri. He had drainage experience and an engineering degree from the University of Missouri. The engineer's first step was to make a complete map of the district, taking elevations on all the land in the district and then submitted a proposed plan. The plan called for a 10-mile ditch. It would start at the mouth of Honey Creek and would parallel the Wabash Railroad. This new channel would rejoin the old channel just over the Livingston county line.

The engineer's plans called for straightening the channels for Lick Fork and Clear Creek for the portion of the creeks in the Grand River basin. Good channel outlets were created for Muddy Creek and Honey Creek.⁵

B. Plans for the New Channel

The board of supervisors began by identifying all the landowners and the number of acres benefitted, and also those providing right of way. Then, the circuit court judge appointed three reliable citizens from outside the county. These three, along with the chief engineer, placed a fair price on each 40-acre tract of land, or fraction, that would be used as a right-of-way for the proposed channel. Total estimated cost for right-of-way payments, damages, and bridges was \$325,000. The land in the district that would be protected by the flood plan was approximately 18,000 acres.

Blueprints were made of all the land in the district and the location of the ditches and bridges to be built. Landowners were requested to study the map and the improvements, and the figures set by the three appraisers. If they felt the values were unsatisfactory, they had the right to file objections in the circuit court, and they would be legally tried.

Several landowners filed objections, and several went to trial. Usually, the figures set by the appraisers were sustained. The Wabash Railroad filed objections to benefits assessed as well as other matters.

Finally, on February 12, 1920, after all the preliminaries had been settled, the bonds were let and the contracts drawn for the digging

of the new channels and the construction of the bridges which the district had to construct where the ditches cut across public roads.⁶

On March 6, 1924, the Gallatin North Missourian states that the bids will be let soon, perhaps on March 12. The contract called for 2-1/2 million yards of dirt to be moved.⁷

On March 13, 1924, contracts were let, over 100 contractors were present for the letting. L. E. Sternberg from Creston, Iowa, was the successful bidder. The amount was .0688 cents per yard, the second bid was for .0689 cents per yard. Total cost came to approximately \$180,000, with the stipulation that the project be completed in 20 months or November 1925.⁸

On April 16, 1925, the drainage work began. Two large drag line excavators were unloaded on the site and work would begin soon. At this same time, the pending lawsuit between the South Daviess County Drainage District and the Wabash Railroad awaited trial.⁹

Another county paper on April 16, 1925, reported more details of the project. The ditch would be ten miles long with four laterals: 1) Muddy Creek, 2) Honey Creek, 3) Lick Fork, and 4) Clear Creek.¹⁰

After the contracts for the new channels were let, the South Daviess County Drainage District entered into a contract with Chillicothe Iron Company. Chillicothe is about 14 miles from the construction site in Livingston County.

Finally, the Wabash dispute with the drainage district, after five years of litigation, was settled. In Federal Court (since they were an out-of-state corporation), the case was tried before Judge Reeves in Kansas City. It lasted nearly two weeks. Although the railroad employed many "experts," the appraiser's figures were upheld.¹¹

The judge ordered that the Wabash Railway Company pay the drainage district \$63,159 in damages.¹²

To dig the drainage ditches, three diesel-powered clam bucket cranes were used. This was the first time diesel-powered equipment was used in Daviess County.¹³

III. THE BRIDGE

A. Description

According to Herbert Greenwood, descendant of E. H. Greenwood, who was an original supervisor of the South Daviess County Drainage District, the cost of the bridge was \$27,000.

The steel for the bridge was fabricated in Chillicothe and transported by teams of horses to the bridge site. Once on site, horsepower was used to lift the steel in position during construction.

The main span of the Lock Springs Bridge is a 150 foot, 8 panel rivet & gusset plate-connected Pratt high through truss. The approach spans are of two 60-foot riveted gusset plate connected Warren trusses at each end with an additional 18-foot steel beam span to the east. The roadway is 15.7 feet wide with a timber deck. The substructure is composed of concrete-filled steel caissons and steel piling. Total length of the bridge is 408 feet. Vertical clearance over the roadway is 17 feet.

Main Span

The main span has diagonal members in tension with five inside vertical members acting in compression. The two vertical members nearest the ends of the main span are hangers and act in tension. The tension members, including the lower chords, consist of two steel angles tied to each other with riveted steel plates. The end posts and top chords are comprised of two steel channels with a solid steel cover plate and laced underside bracing. The vertical compression members are made up of four steel angles riveted to a solid steel plate. The upper sway bracing is fabricated of steel angles with riveted gusset plate connections. The sway bracing is tied to the vertical compression members and end posts. The steel floor beams are attached to the vertical truss members with riveted gusset plates.

The bridge has no metal ornamentation. Local residents and bridge inspection records indicate that plaques did exist on the bridge. The plaques are now gone and their whereabouts is unknown.

The bridge deck is made of rough sawn lumber of various dimensions. The bottom layer of decking is laid transverse to the centerline of the bridge. Two sets of three planks each have been laid longitudinally to serve as runners for vehicle wheels. The deck lays on steel stringers comprised of channels and I beams.

Approach Spans

The four steel truss approach spans are rivet and gusset plate connected Warren trusses with a floor and stringer system identical to the main span. The two innermost trusses are obviously of a different vintage than the outermost trusses. The top chords and end posts of the innermost trusses are comprised of steel angles with a solid steel cover plate, while those of the outermost trusses are steel I beams. The verticals, diagonals and lower chords are comprised of two steel angles on all the approach trusses. The floor beams are attached with riveted gusset plates.

The extreme northeast approach span is a simple steel beam span with stringer and floor system similar to the other spans.

Piers

The piers supporting the main span are riveted steel caissons filled with concrete. The piers are approximately 35 feet in height from the ground to the bridge bearing seat. Both piers have been damaged by drift and ice flows and have been heavily reinforced with a structural steel cage of angles, I beams and channels.

The remaining piers are constructed of steel H piling. Each pier is comprised of six H pilings, varying from 7 to 20 feet in height from ground line to the bridge bearing seat. The piers are cross braced with steel angles and horizontally braced with steel channels.

Abutments

Both abutments are supported by six steel H piles. All are totally buried in road and, as a consequence, not visible for inspection.

B. Modifications

The original relocated and straightened river channel was quite narrow with very steep side slopes. Due to higher velocities and steeper gradient, the channel has scoured itself to a much larger configuration. As a consequence, the original construction, involving only the 150-foot main span, has required lengthening by addition of approach spans. No record indicating the time frame for the modifications has been located.

C. Ownership and Future

Lock Springs Bridge was owned and maintained by South Daviess County Drainage District until the 1950s. At that time, the Daviess County Court/Commission assumed responsibility for its maintenance.

The county bridge inventory number is 127001.5. A structural appraisal of Lock Springs Bridge, conducted on July 17, 1979, revealed that the wooden plank deck has numerous deteriorated, cracked and split sections and is in fairly good condition.

The steel bridge rails are missing on the north side of the easternmost approach span.

The steel through truss members and floor system, the members and floor systems in all four steel pony truss spans, and the steel stringers of the easternmost approach span are visibly corroded, but are in fair condition. The steel pilings and steel cylinder piers are visibly corroded, but are also in fairly condition.

The bridge is posted with an 8-ton load limit. This is not adequate for the vehicles that need to use this bridge.

The Lock Springs Bridge has been scheduled for replacement. The availability of the bridge to individuals or organizations interested in its historical significance has been advertised. No responses have been received.

III. BIOGRAPHICAL MATERIAL

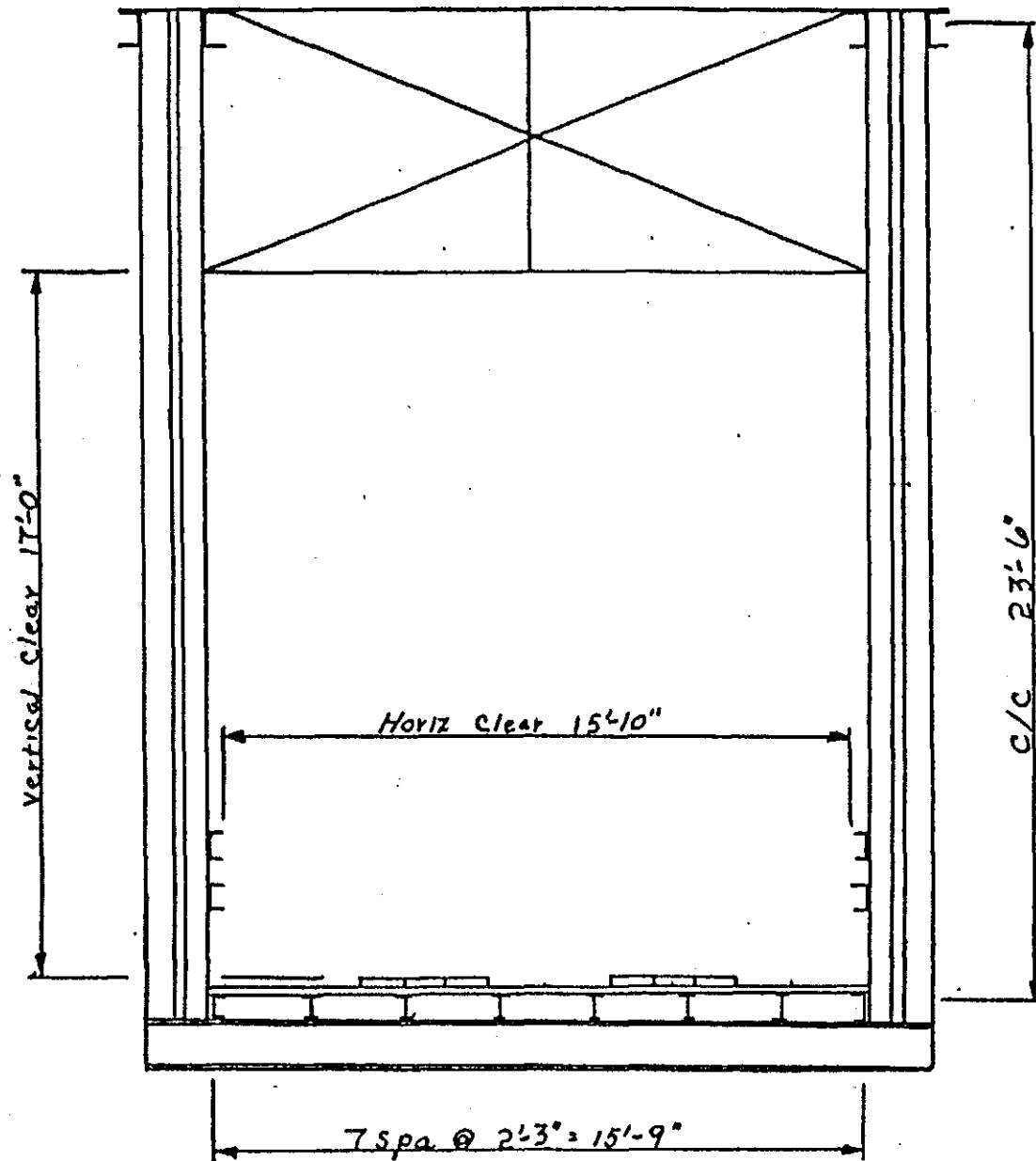
As of August 10, 1911, the Chillicothe Iron Company had been incorporated for fifty years. It was located in Chillicothe, Livingston County, Missouri. The original capital stock was \$8,000, divided between 80 shares of \$100 each.

The company was formed for the following purposes: casting structural iron and doing all manner of foundry work; making new machinery and repairing all machine work; buying and selling, at wholesale and retail, all kinds of machinery, tools, belting, iron and iron products, and all singular goods, wares and merchandise as are usually kept and sold by foundry and machine companies.

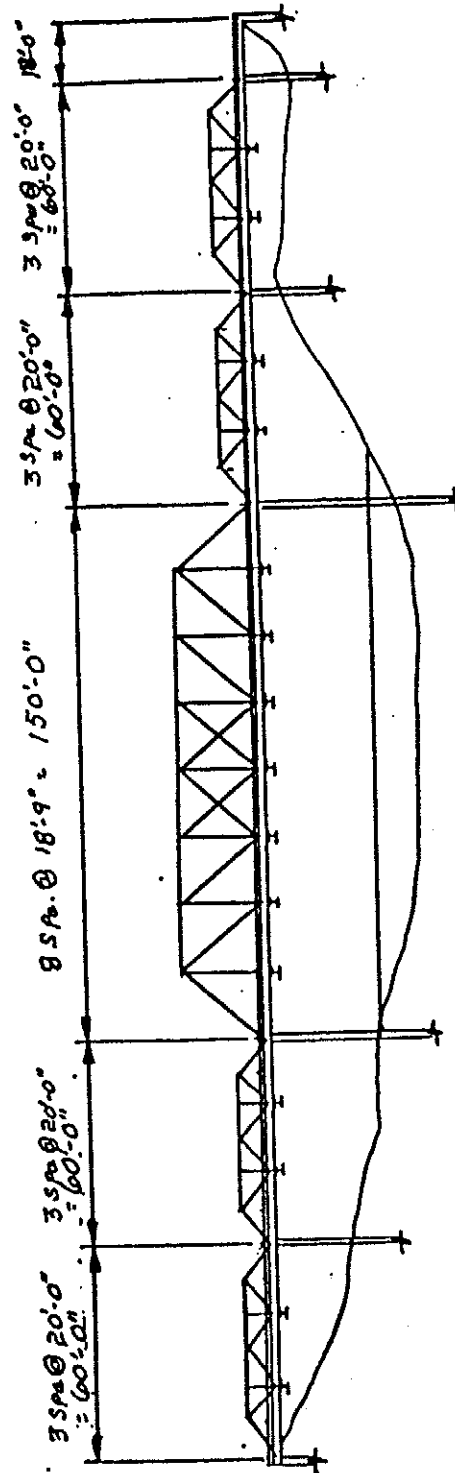
The company was dissolved by a unanimous vote of its shareholders on December 31, 1941.¹⁴

IV. FOOTNOTES

- ¹ Gallatin North Missourian, Gallatin, MO, Microfilm Roll #33, property of Gallatin Publishing Company, June 15, 1916.
- ² Jean Ann Tuggle Paul's library of her father's notes on the South Daviess County Drainage District. Her father, Floyd Tuggle, was chairman of the district.
- ³ Gallatin North Missourian, June 29, 1916.
- ⁴ Ibid., November 2, 1916.
- ⁵ Jean Ann Tuggle Paul's library of her father's notes on the South Daviess County Drainage District.
- ⁶ Gallatin North Missourian, February 12, 1920.
- ⁷ Ibid., March 6, 1924.
- ⁸ Ibid., March 13, 1924.
- ⁹ Ibid., April 16, 1925.
- ¹⁰ Gallatin Democrat, Gallatin, MO, Microfilm Roll #40, property of Gallatin Publishing Company, April 16, 1925.
- ¹¹ Jean Ann Tuggle Paul's library of her father's notes on the South Daviess County Drainage District.
- ¹² Gallatin North Missourian, reel number 41, March 10, 1926.
- ¹³ Herbert Greenwood, descendant of E. H. Greenwood (original drainage district board member), Lock Springs, Daviess County, Missouri.
- ¹⁴ Roy Blunt, Division of Corporations. Secretary of State's Office, Truman Building, Jefferson City, MO, File #4.



Typical Section



South Elevation

